Claims:

1. (original) A cell for electrowinning aluminium from alumina, comprising:

- a metal-based anode having an electrochemically active outer part comprising a layer that contains predominantly cobalt oxide CoO; and
- a fluoride-containing molten electrolyte in which the active anode surface is immersed, the electrolyte being at a temperature below 950°C, in particular in the range from 910° to 940°C, and consisting of:
  - 6.5 to 11 weight% dissolved alumina;
  - 35 to 44 weight% aluminium fluoride;
  - 38 to 46 weight% sodium fluoride;
  - 2 to 15 weight% potassium fluoride;
  - 0 to 5 weight% calcium fluoride; and
  - 0 to 5 weight% in total of one or more further constituents.

2. (original) The cell of claim 1, wherein the electrolyte contains 7 to 10 weight% alumina.

3. (currently amended) The cell of claim 1 ~~or 2~~, wherein the electrolyte contains 36 to 42 weight% aluminium fluoride, in particular 36 to 38 weight.

4. (currently amended) The cell of ~~any preceding~~ claim 1, wherein the electrolyte contains 39 to 43 weight% sodium fluoride.

5. (currently amended) The cell of ~~any preceding~~ claim 1, wherein the electrolyte contains 3 to 10 weight% potassium fluoride, in particular 5 to 7 weight%.

6. (currently amended) The cell of ~~any preceding~~ claim 1, wherein the electrolyte contains 2 to 4 weight% calcium fluoride.

7. (currently amended) The cell of ~~any preceding~~ claim 1, wherein the electrolyte contains up to 3 weight% of said one or more further constituents.

8. (currently amended) The cell of ~~any preceding~~ claim 1, wherein the electrolyte contains as further constituent(s) at least one fluoride selected from magnesium fluoride, lithium fluoride, cesium fluoride, rubidium fluoride, strontium fluoride, barium fluoride and cerium fluoride.

9. (currently amended) The cell of ~~any preceding~~ claim 1, wherein the electrolyte contains alumina at a concentration near saturation on the active anode surface.

10. (currently amended) The cell of ~~any preceding~~ claim 1, wherein the CoO-containing layer is integral with a core made of cobalt or a cobalt alloy.

11. (currently amended) The cell of ~~any preceding~~ claim 1, wherein the anode comprises an electrically conductive substrate that is covered with an applied electrochemically active coating that comprises the CoO-containing layer.

12. (original) The cell of claim 11, wherein the CoO-containing layer is a layer of sintered particles.

13. (original) The cell of claim 11, wherein the CoO-containing layer is an integral oxide layer on an applied Co-containing metallic layer of the coating.

14. (currently amended) The cell of ~~any one of claims~~ **claim** 11 ~~to 13~~, which comprises an oxygen barrier layer between the CoO-containing layer and the electrically conductive substrate.

15. (original) The cell of claim 14, wherein the oxygen barrier layer contains at least one metal selected from nickel, copper, tungsten, molybdenum, tantalum, niobium and chromium, or an oxide thereof.

16. (original) The cell of claim 15, wherein the oxygen barrier layer further contains cobalt.

17. (original) The cell of claim 16, wherein the oxygen barrier layer is a cobalt alloy containing at least one metal selected from nickel, tungsten, molybdenum, tantalum and niobium.

18. (original) The cell of claim 17, wherein the cobalt alloy contains:
- at least one of nickel, tungsten, molybdenum, tantalum and niobium in a total amount of 5 to 30 wt%, in particular 10-20 wt%; and
- one or more further elements and compounds in a total amount of up to 5 wt%,

the balance being cobalt.

19. (original) The cell of claim 18, containing as said further elements at least one of aluminium, silicon and manganese.

20. (currently amended) The cell of ~~any one of claims~~ **claim** 14 ~~to 19~~, wherein the CoO-containing layer is integral with the oxygen barrier layer.

21. (currently amended) The cell of ~~any one of claims~~ **claim** 14 ~~to 19~~, wherein the oxygen barrier layer is integral with the electrically conductive substrate.

22. (currently amended) The cell of ~~any one of claims~~ **claim** 14 ~~to 19~~, wherein the oxygen barrier layer and the CoO-containing layer, or precursors thereof, are distinct applied layers.

23. (currently amended) The cell of claim 13, ~~or claim 21 or 22 when depending on claim 13,~~ wherein the Co-containing metallic layer contains cobalt in an amount of at least 95 wt%, in particular more than 97 wt% or 99 wt%.

24. (currently amended) The cell of ~~any one of claims~~ **claim** 13 ~~to 23~~, wherein the Co-containing metallic layer contains at least one additive selected from silicon, manganese, nickel, niobium, tantalum and aluminium in a total amount of 0.1 to 2 wt%.

25. (currently amended) The cell of ~~any one of claims~~ **claim** 11 ~~to 24~~, wherein the electrically conductive substrate comprises at least one metal selected from chromium, cobalt, hafnium, iron, nickel, copper, platinum, silicon, tungsten, molybdenum, tantalum, niobium, titanium, tungsten, vanadium, yttrium and zirconium, or a compound thereof, in particular an oxide, or a combination thereof.

26. (original) The cell of claim 25, wherein the electrically conductive substrate has an outer part made of cobalt or a cobalt-rich alloy to which the coating is applied.

27. (original) The cell of claim 26, wherein the outer part is made of a cobalt-rich alloy containing at least one of nickel, tungsten, molybdenum, tantalum and niobium, said cobalt alloy containing in particular:

- at least one of nickel, tungsten, molybdenum, tantalum and niobium in a total amount of 5 to 30 wt%, in particular 10-20 wt%; and
- one or more further elements and compounds in a total amount of up to 5 wt%,

the balance being cobalt.

28. (currently amended) The cell of ~~any one of claims~~ **claim** 11 ~~to 27~~, wherein the electrically conductive substrate contains or consists essentially of one or more oxidation-resistant metals.

29. (original) The cell of claim 28, wherein said one or more oxidation-resistant metals is/are selected from nickel, cobalt, chromium and niobium.

30. (original) The cell of claim 25, wherein the electrically conductive substrate is an alloy of nickel, iron and copper, in particular an alloy containing: 65 to 85 weight% nickel; 5 to 25 weight% iron; 1 to 20 weight% copper; and 0 to 10 weight% further constituents.

31. (cancelled)

32. (currently amended) The cell of ~~any preceding~~ claim 1, wherein the CoO-containing layer has an open porosity of up to 12%, in particular up to 7%.

33. (currently amended) The cell of ~~any preceding~~ claim 1, wherein the CoO-containing layer has a porosity with an average pore size below 7 micron, in particular below 4 micron.

34. (currently amended) The cell of ~~any preceding~~ claim 1, wherein the CoO-containing layer contains cobalt oxide CoO in an amount of at least 80 wt%, in particular more than 90 wt% or 95 wt%.

35. (currently amended) The cell of ~~any preceding~~ claim 1, wherein the CoO-containing layer is substantially free of Co_2O_3 and substantially free of Co_3O_4.

36. (currently amended) The cell of ~~any preceding~~ claim 1, wherein the CoO-containing layer is electrochemically active for the oxidation of oxygen ions and is uncovered or is covered with an electrolyte-pervious layer.

37. (currently amended) The cell of ~~any one of claims~~ **claim** 1 ~~to 35~~, wherein the CoO-containing layer is covered with an applied protective layer, in particular an applied oxide layer.

38. (original) The cell of claim 37, wherein the applied protective layer contains cobalt oxide.

39. (currently amended) The cell of claim 37 ~~or 38~~, wherein the applied protective layer contains iron oxide.

40. (original) The cell of claim 39, wherein the applied protective layer contains oxides of cobalt and of iron, in particular cobalt ferrite.

41. (currently amended) The cell of ~~any one of claims~~ **claim** 37 ~~to 40~~, wherein the applied protective layer contains a cerium compound, in particular cerium oxyfluoride.

42. (currently amended) The cell of ~~any one of claims~~ **claim** 37 ~~to 41~~, wherein the applied protective layer is electrochemically active for the oxidation of oxygen ions and is uncovered or is covered with an electrolyte pervious-layer.

43. (currently amended) The cell of ~~any preceding~~ claim **1**, which has an electrochemically active surface that contains at least one dopant, in particular at least one dopant selected from iridium, palladium, platinum, rhodium, ruthenium, silicon, tungsten, molybdenum, tantalum, niobium, tin or zinc metals, Mischmetal, metals of the Lanthanide series, as metals and compounds, in particular oxides, and mixtures thereof.

44. (original) The cell of claim 43, wherein the electrochemically active surface is made of an active material containing the dopant(s) in a total amount of 0.1 to 5 wt%, in particular 1 to 4 wt%.

45. (currently amended) The cell of ~~any preceding~~ claim **1**, comprising a cathode that has an aluminium-wettable surface, in particular a horizontal or inclined drained surface.

46. (original) The cell of claim 45, wherein the cathode has an aluminium-wettable coating that comprises a refractory boride and/or an aluminium-wetting oxide.

47. (currently amended) The cell of ~~any preceding~~ claim **1**, wherein the anode is suspended in the electrolyte by a stem, in particular a stem having an outer part comprising a layer that contains predominantly cobalt oxide CoO.

48. (currently amended) A method of electrowinning aluminium in a cell as defined in ~~any preceding~~ claim **1**, comprising electrolysing the dissolved alumina to produce oxygen on the anode and aluminium cathodically, and supplying alumina to the electrolyte to maintain therein a concentration of dissolved alumina of 6.5 to 11 weight%, in particular 7 to 10 weight%.